Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

M
f.995

HOUSE
PLANNING
AIDS

July 1965
Miscellaneous Publication No. 995

U. S. DEPARTMENT OF AGRICULTURE

CONTROL OF DIRECT SUNLIGHT FOR COMFORT

You can make your house cooler in summer by protecting against direct or reflected rays of the sun. Also, you can reduce the cost of mechanically cooling your house.

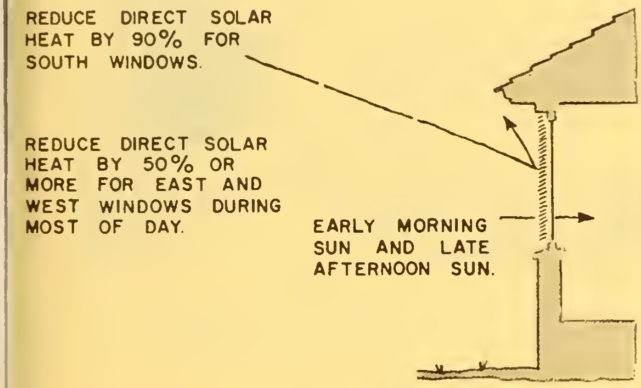
Here are features to make your house more comfortable: Louvers or bar screens, venetian blinds, roof overhangs, light-colored roofing, shade trees, trellis shade, and awnings.

Avoid having blacktop or concrete areas adjacent to your house.

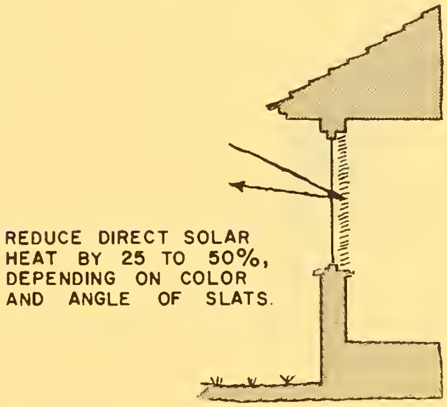
LIBRARY
RECEIVED
SEP 15 1965
U.S. DEPT. OF AGRICULTURE
BELTSVILLE BRANCH

To Reduce Solar Heat:

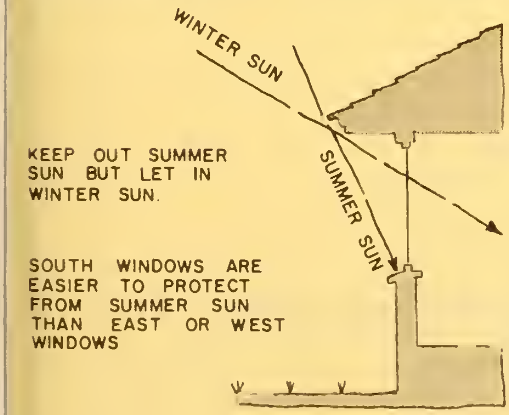
LOUVERS OR BAR SCREEN


REDUCE DIRECT SOLAR HEAT BY 90% FOR SOUTH WINDOWS.
REDUCE DIRECT SOLAR HEAT BY 50% OR MORE FOR EAST AND WEST WINDOWS DURING MOST OF DAY.
EARLY MORNING SUN AND LATE AFTERNOON SUN.

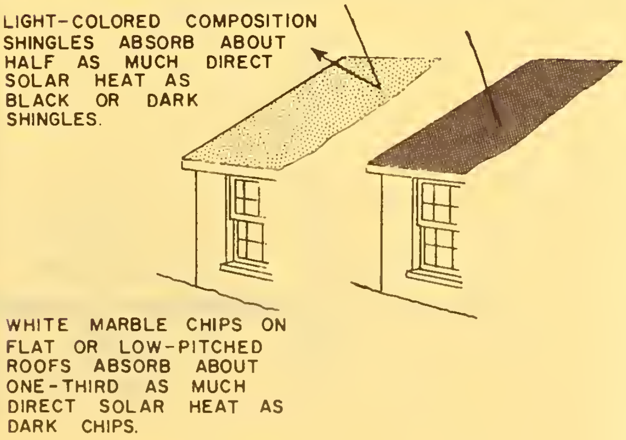
VENETIAN BLINDS


REDUCE DIRECT SOLAR HEAT BY 25 TO 50%, DEPENDING ON COLOR AND ANGLE OF SLATS.

ROOF OVERHANGS

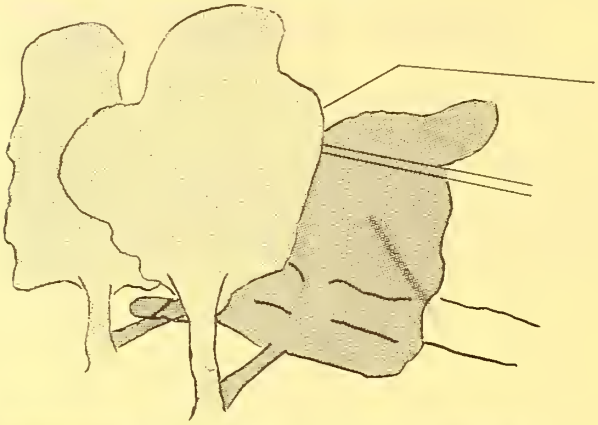

WINTER SUN
SUMMER SUN
KEEP OUT SUMMER SUN BUT LET IN WINTER SUN.
SOUTH WINDOWS ARE EASIER TO PROTECT FROM SUMMER SUN THAN EAST OR WEST WINDOWS

LIGHT-COLORED ROOFING

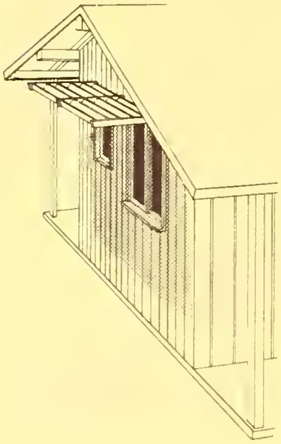

LIGHT-COLORED COMPOSITION SHINGLES ABSORB ABOUT HALF AS MUCH DIRECT SOLAR HEAT AS BLACK OR DARK SHINGLES.
WHITE MARBLE CHIPS ON FLAT OR LOW-PITCHED ROOFS ABSORB ABOUT ONE-THIRD AS MUCH DIRECT SOLAR HEAT AS DARK CHIPS.

SHADE TREES

PLACE YOUR HOUSE WITH MINIMUM GLASS AREA ON EAST AND WEST SIDES, OR SHADE WITH TREES AND LARGE SHRUBS. HOWEVER, IF HOUSE IS NOT MECHANICALLY COOLED, KEEP LARGE SHRUBS AWAY FROM HOUSE TO PERMIT VENTILATION.



TRELLIS SHADE

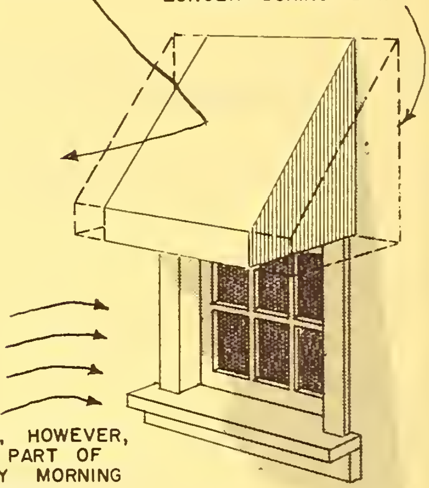


AWNINGS

METAL OR CANVAS--LIGHT COLOR.

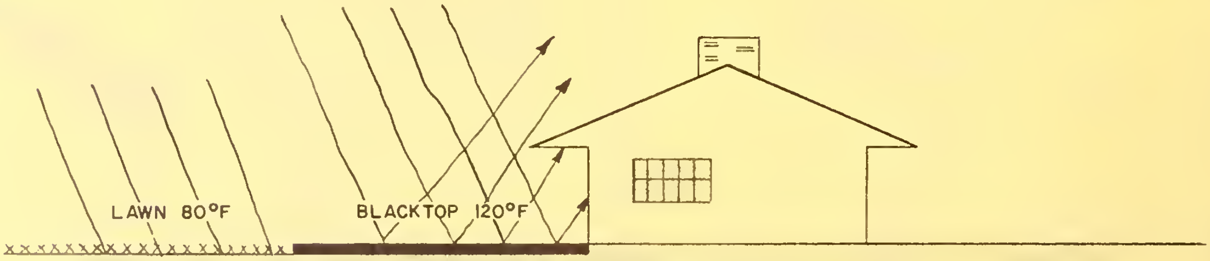
AWNINGS WITH OPEN SIDES ARE BEST. ALL AWNINGS MUST BE WIDER THAN WINDOW TO KEEP OUT SUN LONGER DURING DAY.

REDUCE DIRECT SOLAR HEAT BY 70%



AWNINGS DO NOT, HOWEVER, PROTECT LOWER PART OF WINDOW IN EARLY MORNING AND LATE AFTERNOON

DO NOT HAVE BLACKTOP OR CONCRETE ADJACENT TO HOUSE



BLACKTOP OR CONCRETE AREAS REFLECT AND RERADIATE SOLAR HEAT INTO HOUSE.

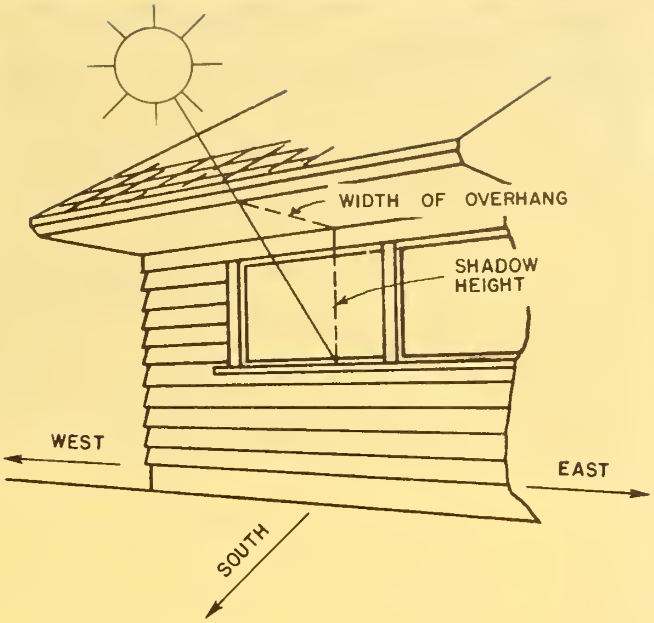
ROOF OVERHANGS

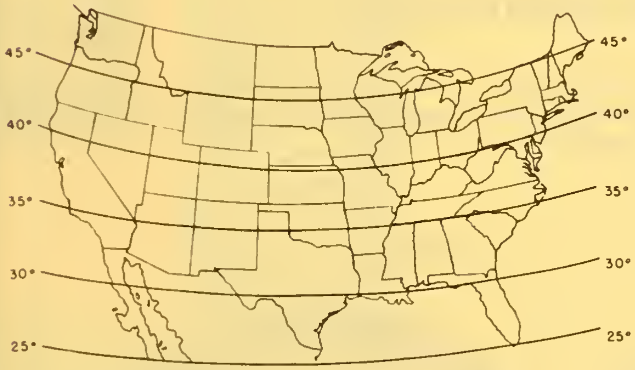
Roof overhangs, or extensions of the roof, over south walls are usually easy to incorporate into house designs. To determine the *width of overhang* needed to shade a south wall or window, follow this method:

(1) Consider the *latitude* of the geographical area in which your house is located. (See map below.) Latitude, together with season of the year, determines the angle at which the sun's rays strike the earth at different times of day.

(2) Measure on your plan or house the number of feet the south windows extend below the eave of the roof or horizontal overhang. This measurement is the *shadow height*.

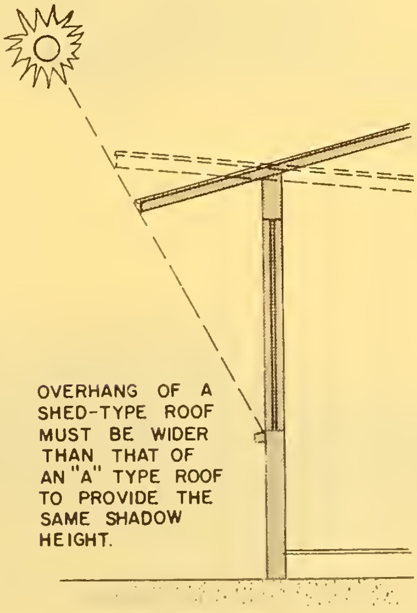
(3) Then for that specific latitude and shadow height, you will find, from the table given here, the exact width of overhang needed.





NORTH LATITUDE (DEGREES)	SHADOW HEIGHT (FEET) 3	4	5	6	7	8
	WIDTH OF OVERHANG (FEET)					
25	1.1	1.5	1.9	2.2	2.6	3.0
30	1.4	1.9	2.4	2.9	3.4	3.8
35	1.8	2.4	3.0	3.5	4.1	4.7
40	2.1	2.8	3.6	4.3	5.0	5.7
45	2.6	3.4	4.3	5.1	6.0	6.8
50	3.0	4.1	5.1	6.1	7.1	8.2

For example, in a latitude of 35° and for a shadow height of 5 feet, the width of overhang needed is 3 feet.



OVERHANG OF A SHED-TYPE ROOF MUST BE WIDER THAN THAT OF AN "A" TYPE ROOF TO PROVIDE THE SAME SHADOW HEIGHT.

Overhangs should also extend east and west of the edges of a south-facing window, to provide shade at least from midmorning to midafternoon. To calculate the *length* of east and west extensions needed, multiply the width of overhang by the factor for the specific latitude, as listed below.

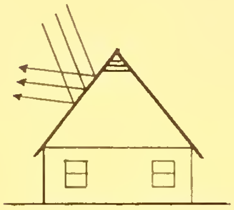
For the example given on page 3, with a latitude of 35° and an overhang 3 feet wide, multiply 3 feet by the factor 1.50, which gives the length of extensions needed on each side of the south window—or 4 feet 6 inches.

East and west windows are more difficult to shade with overhangs than are south windows. In most cases, awnings, louvers or bar screens, trees, and large shrubs can be used effectively.

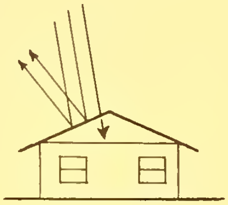
N. LATITUDE (°)	FACTOR
25	2.35
30	1.85
35	1.50
40	1.35
40	1.20
50	1.10

ROOF PITCH AND ORIENTATION

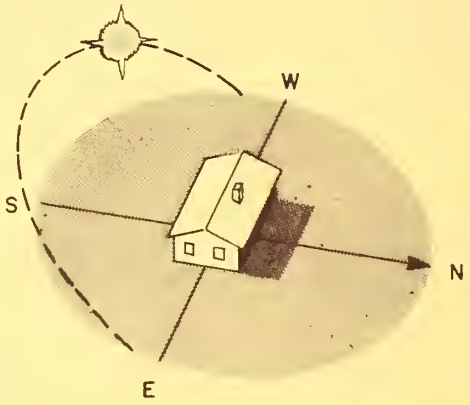
Houses with high-pitched roofs are cooler than those with low-pitched or flat roofs. Roof slopes facing north and south are cooler than those facing east and west. Therefore, if possible, orient your house with the ridge running east and west.



HIGH-PITCHED ROOF



LOW-PITCHED ROOF



The information on roof pitch and orientation was adapted from published data of L. W. Neubauer, Agricultural Engineer, University of California, at Davis.

Prepared by: Joseph W. Simons and W. Russell Parker
AGRICULTURAL ENGINEERING RESEARCH DIVISION
AGRICULTURAL RESEARCH SERVICE

☆U.S. GOVERNMENT PRINTING OFFICE 1965—O-771 219
For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402 · Price 5 cents